

**WHAT IS CLAIMED IS:**

1. A tiled display apparatus with distortion control, comprising:
  - a plurality of display devices, wherein each display device is subdivided into a plurality of sections, and the plurality of sections for each display device are capable of displaying a plurality of sectional images in response to display control signals applied to that display device;
  - a screen;
  - a plurality of lens assemblies optically coupled to the plurality of display devices for projecting the sectional images of the display devices to form a tiled image on the screen;
  - a detector that detects the tiled image and generates feedback signals; and
  - a display controller, coupled to the display devices and the detector, that generates the display control signals to display a commanded image on the screen, receives the feedback signals from the detector, and uses the feedback signals to reduce distortion on the screen.
2. The apparatus of claim 1, wherein the display controller generates the display control signals to display a desired image on the screen, the detector generates feedback signals representative of an actual image that is displayed, and the display controller uses the feedback signals to characterize an error between the desired image and the actual image.
3. The apparatus of claim 2, wherein the display controller introduces an inverse error to subsequent display control signals to cancel out the error that was characterized.

4. The apparatus of claim 2, wherein the desired image is a grid of dots.
5. The apparatus of claim 1, wherein at least one of the detector and an element displayed on the screen move with respect to each other.
6. The apparatus of claim 5, wherein the display controller determines the location of the element on the screen based upon the location of the detector and element when the element is detected.
7. The apparatus of claim 6, wherein the element is a dot located in a grid of dots.
8. The apparatus of claim 1, wherein the detector is located at a fixed location.
9. The apparatus of claim 8, wherein the display controller generates the display control signals to display an element at each of a plurality of commanded locations, and the detector detects a plurality of locations at which the element is actually displayed which correspond to the commanded locations and generates feedback signals representative thereof.
10. The apparatus of claim 1, wherein the detector comprises multiple detectors.
11. The apparatus of claim 1, wherein the lens assemblies are optically symmetric.
12. A tiled display apparatus with distortion control, comprising:  
an image generator that generates display signals indicative of a desired image;

a plurality of display devices, wherein each display device is subdivided into a plurality of sections, and the plurality of sections for each display device is capable of displaying a plurality of sectional images in response to display control signals applied to that display device;

a screen;

a plurality of lens assemblies optically coupled to the plurality of display devices for projecting the sectional images of the display devices to form a tiled image on the screen;

a detector that detects the tiled image and generates feedback signals; and

a display controller, coupled to the image generator, the display devices, and the detector, wherein the display controller generates the display control signals in response to the display signals to display the tiled image on the screen, and also receives the feedback signals from the detector and reduces distortion of the tiled image using the feedback signals.

13. The apparatus of claim 12, wherein the display controller generates the display control signals to display a desired pattern on the screen, the detector generates feedback signals representative of an actual pattern that is displayed, and the display controller uses the feedback signals to characterize error between the desired pattern and the actual pattern.

14. The apparatus of claim 13 wherein the desired pattern is a commanded pattern.

15. The apparatus of claim 12, wherein at least one of the detector and element displayed on the screen move with respect to each other.

16. The apparatus of claim 15, wherein the display controller determines the location of the element on the screen based upon the location of the detector and element when the element is detected.
17. The apparatus of claim 12, wherein the detector is located at a fixed location.
18. A method of generating a tiled display with distortion control, comprising:
  - providing a plurality of display devices;
  - subdividing each of the display devices into a plurality of sections;
  - displaying a sectional image on each section of each display device;
  - projecting the sectional image displayed on each section of each display device onto a screen with the projected sectional images merged into a tiled image;
  - detecting the tiled image and generating feedback signals therefrom; and
  - using the feedback signals to reduce distortion on the screen.
19. The method of claim 18 wherein the feedback signals are also used to reduce artifacts.
20. The method of claim 18, further comprising generating display control signals based upon a desired pattern in the tiled image, and wherein displaying the sectional image on each section of each display device is performed in response to the display control signals.
21. The method of claim 20, wherein the feedback signals are representative of the tiled image, and using the feedback signals includes comparing the desired pattern and tiled image.
22. The method of claim 21, wherein using the feedback signals also includes

determining an error between the desired pattern and tiled images, and wherein generating the display control signals includes using the error to correct for distortion in the tiled image.

23. The method of claim 18, wherein detecting the tiled image includes generating a detection signal by creating motion between a detector and an element displayed on the screen.

24. The method of claim 23 wherein using the feedback signals include determining the location of the element based upon the relative position of the detector with respect to the element when the element is detected.

25. The method of claim 18, wherein detecting the tiled image includes generating a detection signal by displaying an element at each of a plurality of commanded locations, and detecting a plurality of locations at which the element is actually displayed.

26. An apparatus for generating a tiled display with distortion control, comprising:

- a plurality of display devices;
- means for subdividing each of the display devices into a plurality of sections;
- means for displaying a sectional image on each section of each display device;
- means for projecting the sectional image displayed on each section of each display device onto a screen with the projected sectional images merged into a tiled image;
- means for detecting the tiled image and generating feedback signals therefrom; and

means for using the feedback signals to reduce distortion on the screen.

27. For use in a tiled display apparatus comprising a plurality of display devices that are each subdivided into a plurality of sections for displaying a plurality of sectional images, a screen onto which the sectional images are projected to display a tiled image, and a detector that detects the tiled image and generates feedback signals therefrom, a display controller comprising:

means for generating display control signals that are based upon a desired image;

means for applying the display control signals to the display devices to cause the plurality of sectional images to be displayed on the plurality of sections of each of the display devices;

means for receiving the feedback signals from the detector; and

means for correcting the display control signals using the feedback signals to reduce error between the desired image and the tiled image.

28. A computer readable medium having instructions thereon for causing a display controller to perform a method of generating a tiled image with distortion control, the tiled image being provided by a tiled display apparatus comprising a plurality of display devices each of which is subdivided into a plurality of sections for displaying a plurality of sectional images, a screen onto which the sectional images are projected to display the tiled image, and a detector that detects the tiled image and generates feedback signals therefrom, the method comprising:

generating display control signals that are based upon a desired image;

applying the display control signals to the plurality of display devices to cause the plurality of sectional images to be displayed on the plurality of sections of each display device;

receiving the feedback signals from the detector; and

correcting the display control signals using the feedback signals to reduce error between the desired image and the tiled image.